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EFFECT OF INTEGRATED NUTRIENT MANAGEMENT ON PLANT GROWTH OF BRINJAL (*SOLANUM MELONGENA* L.)

KATAR S. BARMAN[1], J.P. COLLIS[2], MURALIDHARAN. B[3] & V. M. PRASAD[4]

Sam Higginbottom Institute of Agriculture, Technology & Sciences, Department of Horticulture, Allahabad School of Agriculture, Allahabad (U.P.) India

ABSTRACT

The present investigation entitled "Effect of integrated nutrient management on growth, flowering, yield and quality of brinjal (Solanum melongena L.)" was laid out in randomized block design in factorial concept with three replications during the winter season of 2013 and 2014 at Main Experiment Station, Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences Allahabad, (U.P) India. The Eleven treatment combinations on two varieties allocated randomly in each plot during both the year of experimentation. The growth parameters viz, Height of plants at 15 days of establishment (V_1 andT_2), Height of plant at maturity (V_2 andT_2) and First branch appearance on plant after transplanting (V_1 and T_3) total number of branches per plant, days taken at 50% flowering was found maximum significant due to variety V_1 and treatment T_3 and interaction (V x T) was found non-significant during both the years. Among INM treatment proved to be beneficial for getting maximum yield of brinjal under eastern Uttar Pradesh conditions.

KEY WORDS: Brinjal, INM & Plant Growth

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INTRODUCTION

Brinjal or egg plant (*Solanum melongena* L.), a member of "Solanaceae" family, is one of the most common vegetable crops grown in India. Brinjal is a staple vegetable. Its nutritive value varies among varieties. It contains vitamin A and B. It has been under cultivation in the sub-continent since ancient times and is available in the market year-around in these days (Malik, 1994). Brinjal is famous as a poor man's crop because it finds the place among the vegetables, where higher productions of vegetable are important observations. The brinjal is staple vegetable in almost all tropical countries in the world and liked by both poor and rich. It is a non-tuberiferous species of solanum. In India it might have spread to African and European countries. It is main vegetable in plains areas of India and almost available throughout the year. 8% of total area under vegetables in the country is occupied by brinjal.

Brinjal is a stable vegetable high in nutritive value. It is rich in minerals is Ca, Mg, P, K and Fe. It is also a good source of Vitamin A and C. Purple variety has higher copper content and polyphenol oxidase activity where as iron and catalase activity is the highest in the green cultivars. Amino acid content is higher in purple variety.

High productive ability of brinjal puts tremendous pressure on soil for removal of nutrients. As such liberal application of nutrients is needed to meet the nutritional requirements of the crops, however, wake of energy crisis, harmful effect on soil health and ever increasing prices of chemical, fertilizers becomes problem before the producers. Integrated nutrient management is one of the important parts of continuous improvement of

soil productivity and it can only be possible by the judicious use of fertilizers along with organic manures.

In view of above a dire need have been felt to reduce the cost of fertilizer which is costly input and this can be managed through integrated nutrient management which involves conjunctive use of fertilizer and organic manure to sustain crop production and maintenance of soil health (**Nanjappa *et al.* 2001**).

MATERIALS AND METHODS

The field experiment was conducted at Main Experiment Station, Department of Horticulture, Sam Higginbottom Institute of Agriculture, Technology and Sciences Allahabad, (U.P) India. Two varieties (Pusa Shyamala and KS-224) and eleven treatments *viz.*, **T_1**(Control) (Recommended dose of NPK 100:50:50), **T_2** (75% recommended dose of nitrogen through in organic fertilizers + 25% nitrogen through FYM), **T_3**(75% recommended dose of nitrogen through inorganic fertilizer + 25% nitrogen through poultry manure), **T_4** (50% recommended dose of nitrogen through inorganic fertilizer + 50% nitrogen through FYM), **T_5**(50% recommended dose of nitrogen through inorganic fertilizer + 50% nitrogen through poultry manure), **T_6** (50% recommended dose of nitrogen through inorganic fertilizer + 25% nitrogen through FYM + 25% nitrogen through poultry manure), **T_7**(25% recommended dose of nitrogen through inorganic fertilizer + 50% nitrogen through FYM + 25% nitrogen through poultry manure), **T_8** (25% recommended dose of nitrogen through inorganic fertilizer + 25% nitrogen through FYM + 50% nitrogen through poultry manure), **T_9** (75% recommended dose of nitrogen through FYM + 25% nitrogen through poultry manure), **T_{10}** (75% recommended dose of nitrogen through poultry manure + 25% FYM), **T_{11}** (50% recommended dose of nitrogen through FYM + 50% nitrogen through poultry manure) were allocated randomly in each plot in factorial randomized block design with three replications. Observations recorded on the plant growth parameter Germination percentage, Field emergence (%), Height of Plants (cm) after 15 of establishment, Height of Plants (cm) at maturity stage, Diameter of main stem (cm) at first flowering stage, First branch appearance on plant after transplanting (days) and total number of branches per plant, The treatments were compared with the help of critical difference, following the techniques described by **Panse** and **Sukhatme (1967)** and results were evaluated at 5% level of significance.

RESULTS AND DISCUSSIONS

Vegetative and reproductive growth of plant plays an important role in realizing potential yield of crop. Per cent emergence of seed in nursery did not influence significantly during both the years of investigation, while, after transplanting the other growth parameters *viz,* Maximum plant height at 15 DAT (16.08 and 16.57cm), plant height at maturity (75.54 cm and 77.19 cm) similarly finding by **Waseem*et al.* (2013)**, first branch appearance on plant after transplanting (29.50 and 30.39 days) and diameter of main stem (cm) at flowering (1.38 and 1.42 cm) was found in treatment 75% recommended dose of nitrogen through FYM + 25% nitrogen through poultry manure (T_9) while it was minimum in treatment 75% recommended dose of nitrogen through inorganic fertilizer + 25% nitrogen through poultry manure (T_3) in both varieties Pusa Shyamala and KS-224 during 2013-2014 respectively. These results are in conformity with the findings of **Duhhoon*et al.* (2001**).

Whereas maximum total number of branches per plant (33.50 and 34.51) was produced in treatment T_{11} (50% recommended dose of nitrogen through farm yard manure + 50% nitrogen through poultry manure), while it was minimum in treatment T_5 (50% recommended dose of nitrogen through inorganic fertilizer + 50% nitrogen through poultry manure) in both varieties Pusa Shyamala and KS-224 during both the years of investigation. These results are supported by the

report of **Wang and Kale (2004)** in brinjal.

CONCLUSIONS

The optimum dose for getting maximum production of brinjal per hectare. The growth parameters *viz*, Height of plants at 15 days of establishment (V_1 andT_2), Height of plant at maturity (V_2 andT_2) and First branch appearance on plant after transplanting (V_1 and T_3) total number of branches per plant, days taken at 50% flowering was found maximum significant due to variety V_1 and treatment T_3 and interaction (V x T) was found non-significant during both the years. One of the recent developments in the field of agricultural science has been the use intergraded nutrient management which has brought about a sort of revolution in growing of some horticultural crops. Intergraded nutrient management had positive effect on plant growth of brinjal as anti enhanced brinjal production.

Table 1: Effect of Integrated Nutrient Management on Plant Growth of Brinjal (*Solanum melongena L.*)

Treatments	2013					2014				
	Height of Plants (cm) After 15 Days of Establishment	Height of Plant (cm)at Maturity	First Branch Appearance on Plant After Transplanting (Days)	Diameter of Main Stem (cm) at Flowering	Total Number of Branches per Plant	Height of Plants (cm) After 15 Days of Establishment	Height of Plant (cm)at Maturity	First branch Appearance on Plant After Transplanting (days)	Diameter of Main Stem (cm) at Flowering	Total Number of Branches Per Plant
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
T_1	14.78	73.71	39.17	1.22	32.33	15.23	75.19	40.14	1.25	33.10
T_2	13.80	63.09	40.17	1.05	27.17	14.24	64.35	41.37	1.08	27.98
T_3	13.39	67.03	41.50	1.08	26.00	13.80	68.37	42.75	1.11	26.78
T_4	14.54	65.41	36.33	1.14	29.33	14.98	66.72	37.42	1.18	30.21
T_5	13.67	64.52	41.00	1.08	25.67	14.08	65.81	42.23	1.11	26.44
T_6	13.89	66.60	35.00	1.18	29.33	14.30	67.93	36.05	1.22	30.21
T_7	15.30	71.06	32.67	1.33	33.33	15.75	72.49	33.65	1.36	34.33
T_8	14.05	67.09	35.67	1.15	29.50	14.47	68.43	36.55	1.18	30.39
T_9	16.08	75.54	29.50	1.38	27.85	16.57	77.19	30.39	1.42	28.63
T_{10}	15.12	67.46	39.64	1.20	32.13	15.57	68.81	41.03	1.23	33.30
T_{11}	15.75	72.14	31.67	1.31	33.50	16.20	73.58	32.62	1.34	34.51
Average	**14.58**	**68.51**	**36.57**	**1.19**	**29.65**	**15.02**	**69.90**	**37.65**	**1.23**	**30.53**
	V x t	V x t	V x t	V x t	V x t	V x t	V x t	V x t	V x t	V x t
SEm±	0.557	2.315	1.294	0.049	1.314	0.601	2.696	1.468	0.042	1.119
C.D.(P =0.05)	NS	NS	NS	NS	3.750	NS	NS	NS	NS	3.194
CV	6.61	5.85	6.12	7.18	7.67	6.93	6.68	6.75	7.18	6.34

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